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Subject: RE: digital Filtering
Full Name: Nic Birsan (Ploiesti Romania)
Date: 16/Aug/02 2:24 am
Read: 125 times
Score: Hasn't been scored

As the analog filtering, digital filtering is a method to alter or remove unwanted freq components from a signal. (I guess you know about lowpass, highpass, bandpass an filters).
Generally, a filter has a form of:

```
y[n] = 1/a0*(B x X -A x Y)
where y[n] is the output response
      B is a k-dimension vector - contains forward coefficients;
      X is a k-dimension vector - containing past k samples from th
      A is a (n-1)-dimension vector - reverse coeff.
      Y is a (n-1)-dimension vector - contains past n-1 outputs fro
```

In most filter designs coefficient a0 is =1 (anyway it can be containd in B vector).

Now, if A vector contains just null elements the filter will be an finit impuls respons if not the filter is called infinit impulse response (IIR- the output depends of the past assumed that it's response will be infinit) .
So, you can see – the implementation is not such a big problem – you must multiply simple filter is a moving average, that is al the elements from the B vector have the s =SAMPLE_COUNT.

The problem is what values to put in the A and B vectors – to design the filter – that your requirements. It can be designed in time or in frequency – I see Steve can help responses.

Now about 8051 – this chip is not a good option for digital filtering, I have impleme maximum of 3-4 dimension arrays for low frequency.

P.S. I was interrupted in the middle of my response – I agree with Peter – you must problem.

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Subject: moving average
Full Name: Peter Dannegger (Berlin Berlin)
Date: 14/Aug/02 7:44 am
Read: 505 times
Score: Hasn't been scored

Kunal wrote:

"Hey can anybody tell me a bit more about my moving average code? Is it right, is it innovative as I thought, or is it the normal way to go about it?"

Hi Kunal,

I started a new thread, to make it easier to search for this topic later.

Following an example written completely in C, maybe it was similiar to this, what y mean:

```
#define SAMPLE_COUNT    16

#define div_rnd(x,y)    ((x + (x >> 1)) / y)


int moving_average( int val )
{
  static int samples[SAMPLE_COUNT] = { 0 };
  static char sample_no = 1;

  int aver = 0;
  char i;

  if( --sample_no == 0 )
    sample_no = SAMPLE_COUNT;

  for( i = SAMPLE_COUNT; i; i-- ){
    if( i == sample_no )
      samples[i-1] = val;
    aver += samples[i-1];
  }
  return div_rnd( aver, SAMPLE_COUNT );
}
```

Now my previous example again, but it has a different characteristic. I know not if i also named "moving average":

```
adc_input[channel] -= adc_input[channel] / SAMPLE_COUNT
                    - (((uint)ADDH << 2) | (ADDL & 0x03));
```

Peter

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moving average		Peter Dannegger	14/Aug/02 7:44 am
RE: moving average	New	Charles Bannister	14/Aug/02 8:04 am
RE: moving average	New	Steve M. Taylor	14/Aug/02 12:44 pm
RE: moving average	New	Jon Ward	14/Aug/02 1:38 pm
RE: moving average	New	erik malund	14/Aug/02 1:49 pm
RE: Steve	New	Peter Dannegger	15/Aug/02 12:16 am
RE: moving average	New	Peter Dannegger	15/Aug/02 12:30 am
RE: moving average	New	Peter Dannegger	15/Aug/02 5:26 am
RE: Peter.		Steve M. Taylor	15/Aug/02 5:28 am
RE: moving average	New	Jon Ward	15/Aug/02 7:57 am
RE: moving average	New	Kunal Kandekar	15/Aug/02 8:59 am
RE: moving average	New	Jon Ward	15/Aug/02 5:30 pm

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Subject: RE: moving average
Full Name: Steve M. Taylor (Manchester Uk) Moderator
Date: 14/Aug/02 12:44 pm
Read: 115 times
Score: Hasn't been scored

An often better filter characterstic that is fairly easy to implement is the "Exponentia forgetter", which is the function

Filter(n)=sample *K +(1-k)filter(n-1)
0 < k < 1

As K reduces the filter gets "slower". We often bits that kick out samples that are X away from the "mean" output.

Steve

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